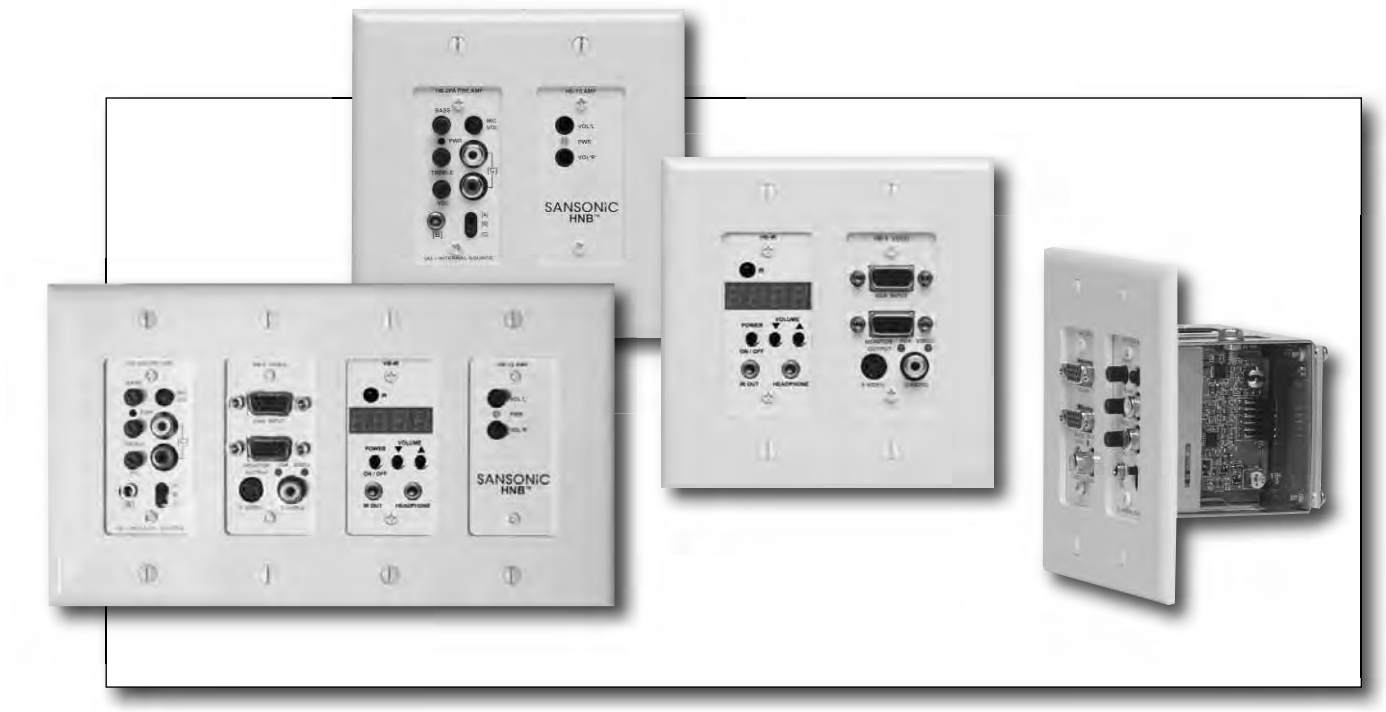
SANSONIC

Installation and Technical Application Guide

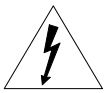
HNB-A and HNB-B



HNB™ Modular
Digital Audio and Video Mixer Amplifiers

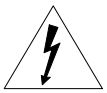
Sansonic Electronics USA LLC ■ 9950 E. Baldwin Place, El Monte CA 91731 ■ (T) 626-454-8203 ■ (F) 626-433-1079 ■ (W) www.sansonic.net

IMPORTANT SAFETY INSTRUCTIONS

WARNING
CLASS 2 WIRING MUST BE USED.

Make all wiring connections prior to AC connection and power up.

WARNING:

To reduce the risk of fire or electric shock, do not expose this device to rain or moisture. Device shall not be exposed to dripping or splashing and no objects filled with liquids, such as glasses or vases, shall be placed on the device.

WARNING FOR YOUR PROTECTION PLEASE READ THE FOLLOWING:

1) Read these instructions.
2) Keep these instructions.
3) Heed all warnings
4) Follow all instructions.
5) Do not use this device near water.
6) Clean only with a dry cloth.
7) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8) Do not install near any heat sources such as radiators, heat registers, stoves, or other devices (including amplifiers) that produce heat.
9) Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10) Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the device.
11) Only use attachments/accessories specified by the manufacturer.
12) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the device, the device has been exposed to rain or moisture, does not operate normally, or has been dropped.

IMPORTANT NOTICES

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Installation Guide	SAN-HNB-AB-001
Device models	HNB-A, HNB-B, HNB-B1, HNB-B2 Modular Digital Mixer Amplifiers for Audio & Video
1st Edition	June, 2008

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We appreciate all comments which may improve or enhance the understanding and use of this product by the installer and or end user and ask that all communication regarding this publication be directed to:

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SANSONIC **Installation and Technical Application Guide**
HNB™ Modular Digital Mixer Amplifiers for Audio and Video

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Check Carton Contents:

HNB-A
Audio Amplifier / Preamplifier
(stand-alone AUDIO system)

Contains the following:
- Plug-in pre-amplifier card (HB-2PA)
- Plug-in amplifier card stereo/mono (HB-1S)
- 24VDC/2.5A power supply
- 2-gang metal chassis with back-plane
- 2-gang Decora-style plastic wall plate
- Assorted plug-in connectors and hardware

HNB-B
Video / IR Control

Contains the following:
- Plug-in IR receive card (HB-IR)
- Plug-in video transmit card (HB-V)
- Video receiver box (HB-VR)
- Hand-held IR remote control
- 2-gang metal chassis with back-plane
- 2-gang Decora-style plastic wall plate
- Assorted plug-in connectors and hardware

Package requires equal quantity HNB-A

HNB-B1
Video only

Contains the following:
- Blank plate
- Plug-in video transmit card (HB-V)
- Video receiver box (HB-VR)
- 2-gang metal chassis with back-plane
- 2-gang Decora-style plastic wall plate
- Assorted plug-in connectors and hardware

Package requires equal quantity HNB-A

HNB-B2
IR only

Contains the following:
- Plug-in IR receive card (HB-IR)
- Blank plate
- Hand-held IR remote control
- 2-gang metal chassis with back-plane
- 2-gang Decora-style plastic wall plate
- Assorted plug-in connectors and hardware

Package requires equal quantity HNB-A

SECTION 1.0 - HNB-A + HNB-B INTRODUCTION AND APPLICATIONS

HNB-A **HNB-B**

HNB-A (2-gang) and HNB-B (2-gang) may be installed into 4 or 6-gang 3.5" DEEP electrical boxes allowing for expansion with HNB-B and/or HNB-B + HNB-C (wireless). Note: 2-gang wall plates are provided.

The HNB-A and HNB-B systems are capable of supporting numerous applications, including but not limited to: ***ALL EDUCATION*** *classrooms,* ***CORPORATE*** *boardrooms, conference rooms, break-out areas, briefing centers, lobbies, private offices,* ***ENTERTAINMENT*** *theater backstage dressing rooms, green rooms, practice rooms, stadium skyboxes, concession stands,* ***RETAIL*** *stores, restaurants and salons,* ***HOSPITALITY*** *rooms,* ***CHURCH*** *multi-use, overflow areas,* ***HEALTHCARE*** *surgery or recovery, lobbies, doctors offices, administration areas and wherever a complete communication package for audio and video with wireless add-on capability is desirable.*

The HNB™ concept:

The HNB system is flexible, easy-to-install, use, upgrade and maintain. It is an affordable solution for any room requiring integration of audio, video and wireless 'Soundfield' amplification. HNB supports a wide range of Audio and A/V applications with built-in compatibility to laptops, desktop computers, A/V projectors, VCR, DVD, DVR, iPOD, MP3, and microphone input sources for use in teaching and training environments. The HNB system is a common sense 'purpose built' solution for universities, colleges, K-12 schools and corporate training facilities.

In addition to A/V application support, the HNB system unifies all major emergency communications systems into a comprehensive and seamless solution to everyday needs. HNB is simple in its design and operation providing immediate benefit to Consultants, Contractors and End-users.

The HNB™ building blocks: A + B + C

The HNB system is based on a simple premise of 'hang and bang' = Simple, Fast, Affordable, Reliable and Secure. From the ground-up HNB starts by using the most common device found throughout all building types in North America – the common NEMA/UL rated electrical gang box. HNB takes up no space in the room, is totally secure while using the most inexpensive and widely available mounting option in the market. HNB is a modular 'plug and play' system integrating the most basic media room elements of Audio (A) + Video (B) + Wireless (C) which interconnect via standard CAT5e UTP cable. *NOTE: Wireless HNB-C package is covered in a separate installation manual #SAN-HNB-C.* The HNB system always starts with the 'A' package (HNB-A) providing a 2-gang modular AUDIO system with an Amplifier and Preamp in addition to key I/O interconnections to vital room communication systems including; Fire and Alarm, Security, PA and Intercom (1v-70v), Archival or Recording systems, ancillary power amplifiers or 'control' audio systems.

If VIDEO is required and/or IR control is desired add the HNB-B unit. This additional 2-gang unit provides transmission of VGA/RGB, S-video, Composite video signals while providing a buffered VGA Monitor output. Video transmit and receive are accomplished via a single CAT5e UTP cable up to 150 feet to the AV Projector.

If WIRELESS 'Soundfield' teacher amplification or ADA assisted listening (hard of hearing) and or simultaneous 2nd language translation is important to improve the education experience for Teachers, Students, Parents and the Community then add HNB-C. The Wireless HNB-C can be added at anytime to HNB A or HNB A + B depending on your room requirements. HNB-C is an RF based system providing up to two (2) channels of transmit and two (2) channels of receive signals to headsets, hand-held microphones, and headphones which can be paired to any HNB-C equipped room in less than (30) seconds! *NOTE: Wireless HNB-C package is covered in a separate installation manual #SAN-HNB-C*.

1.1 HNB-A: AUDIO system

HNB-A

HNB-A Contents:
(1) HNB-2-gang metal chassis
(1) HB-2PA Preamp card
(1) HB-1S Digital amp card
(1) 24VDC/2.5A Power supply
(1) 2-gang Decora white wallplate

Basic Capabilities
HNB-A
- Fits standard 3.5" deep 2-gang electrical box or 4-gang, 6-gang for expansion of HNB 'B' and 'C' units.
- (3) Audio inputs switchable (RCA, 3.5mm, Phoenix)
- Dual channel Class D digital amp for mono or stereo operation.
- Interface to microphone system (wired or wireless).
- Override interface to fire and alarm (EAO).
- Override interface to security system with alarm.
- Override interface to intercom – PA system, 1V – 70V, (MO).
- Audio line output to record or connect to ancillary audio power system.
- Power 4-8 ohm speakers or 25-70V speakers with optional HNB-70V2X.
- CAT5e UTP interface to expansion HNB-B (Video/IR) or HNB-C (Wireless) units.
- 24VDC/2.5A UL-CUL wall power supply / Class 2 low-voltage.

1.2 HNB-A + HNB-B: AUDIO + VIDEO + IR system

HNB-A + HNB-B
shown with 4-gang wall plate*

HNB-A Contents:
(1) HNB-2-gang metal chassis
(1) HB-2PA Preamp card
(1) HB-1S Digital amp card
(1) 24VDC/2.5A Power supply
(1) 2-gang Decora white wallplate

HNB-B Contents:
(1) HNB-2-gang metal chassis
(1) HB-V Video card VGA, S-video + C-video
(1) HB-VR Video receiver
(1) HB-IR 'IR' Control card
(1) HB-IRC Hand-held IR remote control
(1) 2-gang Decora white wallplate

Basic Capabilities
HNB-A
- Fits standard 3.5" deep 2-gang electrical box or 4-gang, 6-gang for expansion of HNB 'B' and 'C' units.
- (3) Audio inputs switchable (RCA, 3.5mm, Phoenix)
- Dual channel Class D digital amp for mono or stereo operation.
- Interface to microphone system (wired or wireless).
- Override interface to fire and alarm (EAO).
- Override interface to security system with alarm.
- Override interface to intercom – PA system, 1V – 70V, (MO).
- Audio line output to record or connect to ancillary audio power system.
- Power 4-8 ohm speakers or 25-70V speakers with optional HNB-70V2X.
- CAT5e UTP interface to expansion HNB-B (Video/IR) or HNB-C (Wireless) units.
- 24VDC/2.5A UL-CUL wall power supply / Class 2 low-voltage.

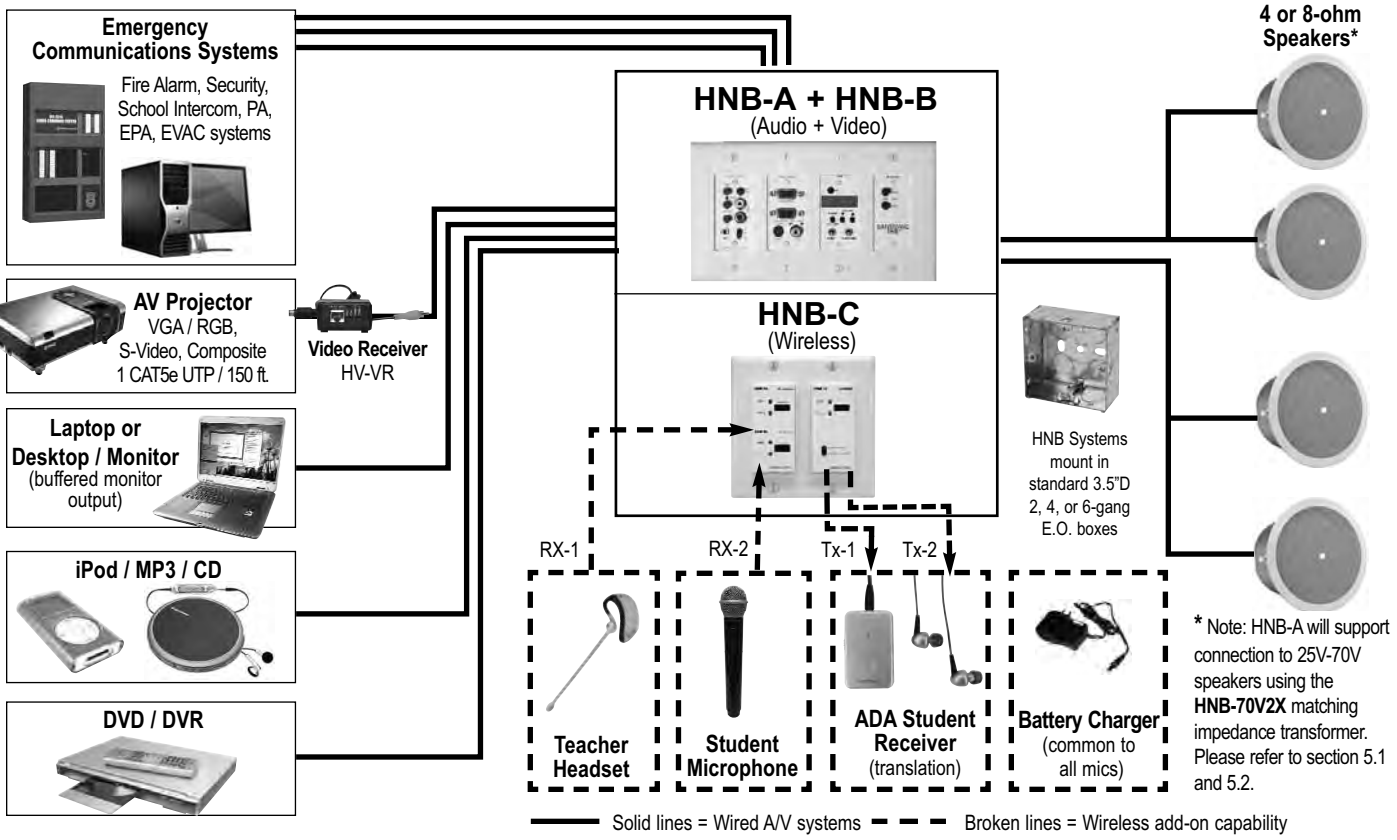
HNB-B
- Interface with HNB-A unit via RJ45/CAT5e UTP cable.
- Video inputs (VGA, S-video, Composite video)
- Video transmission via single CAT5e UTP cable up to 150 feet.
- VGA buffered monitor output.
- RJ45/CAT5e UTP connection to remote video receiver with discrete output cables (VGA, S-video, composite video).
- IR remote control with LED extender (On/Off, Volume +/-, Bass/Treble, Balance, Mute).

** Note: 4 and 6-gang Decora wall plates are not provided*

SANSONIC Installation and Technical Application Guide

HNB™ Modular Digital Mixer Amplifiers for Audio and Video

1.3 HNB Classroom Application: HNB-A + HNB-B + HNB-C (AUDIO + VIDEO + WIRELESS)



1.4 HNB Competitive Feature Comparison HNB-A + HNB-B + HNB-C (AUDIO + VIDEO + WIRELESS)

Manufacturer	**Sansonic HNB** A+B+C	Audio Enhancement Ultimate II	Lightspeed 880iR	Teach Logic Spectrum	Front Row Pro	Bogen Enhancer
Amplifier power	**50W**	72W	72W	40W	40W	35-65W
Wireless technology (HNB-C)	**RF**	IR	IR	IR	IR	IR
Requires body pack wires with batteries	**No**	Yes	Yes	Yes	Yes	Yes
Secure in-wall, surface or in-ceiling mount (EO/J-box compatible)	**YES**	No	No	No	No	No
IR Headset (Tx) / Headphone (Rx) pairing	**YES**	No	No	No	No	No
ADA transmit with receive headphones (2 channels)	**YES**	No	No	No	No	No
Wireless channels per system (Rx + Tx)	**4**	2	2	2	2	2
Video inputs to projector	**YES**	No	No	No	No	No
Fire and alarm override	**YES**	No	No	No	No	No
Intercom / paging override 1V-70V	**YES**	No	No	Yes	No	No
Security override with alarm tone	**YES**	No	No	No	No	No
Number of audio inputs	**4**	3	4	3	2	3
Audio line out - record, podcast, larger system	**YES**	No	No	Yes	No	No
Headset mobility 'PAIR' to any room / any channel	**YES**	No	No	No	No	No
Simultaneous translation - 2nd language	**YES**	No	No	No	No	No
Plug-in options upgrade	**YES**	No	No	No	No	No
Stereo / mono operation	**YES**	Yes	Yes	Yes	Yes	Yes
EMI-RFI protection	**YES**	No	No	No	No	No
'HAC' Hearing aid compatible headset (FCC)	**YES**	No	No	No	No	No
Remote IR audio control	**YES**	No	No	No	No	No
Video input types	**VGA, S, Composite**	None	None	None	None	None
VGA/RGB output to desktop monitor	**YES**	No	No	No	No	No
USB mini jack battery charger interface / power from computer	**YES**	No	No	No	No	No
Battery type	**Lithium polymer + NiMH AA**	NiMH AA	NiMH AA	NiMH AA	NiMH AA	NiMH AA
Battery charger - recharge time (full charge headset)	**100 minutes**	12 hrs	10 hrs	3 hrs	6 hrs	8 hrs
Battery charger DOE / EPA Energy Star Rated	**YES**	No	No	No	Yes	No

SECTION 2.0 - HNB-A + HNB-B OVERVIEW

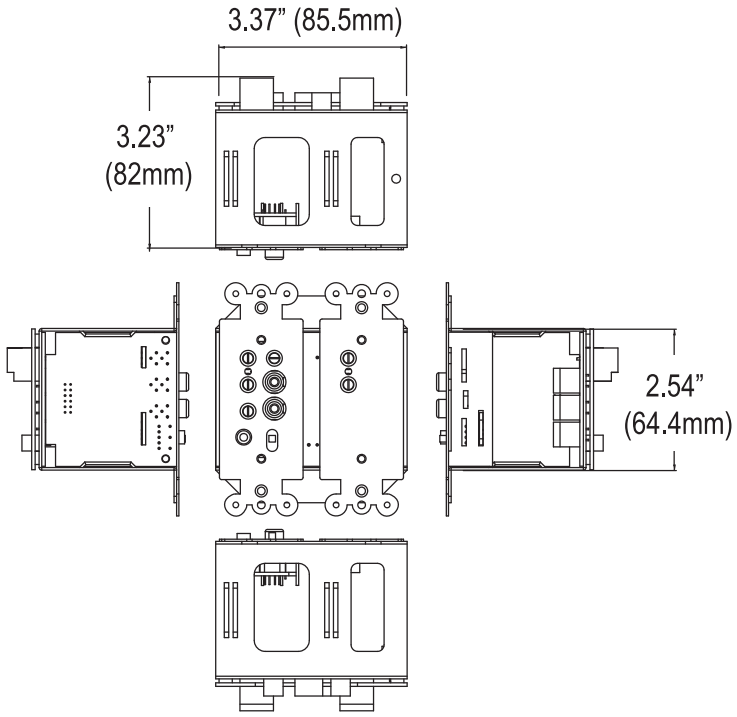
2.1 HNB-A and HNB-B Series Technical Specifications

Type	2 Channel Mixer Amplifier
Architecture	Digital Class-D
Mains Input Power	100-240VAC, 50-60Hz
Input Power (to HNB™)	24VDC in-line regulated switching wall supply, 2.5A, FCC, UL, CUL, CE listed (provided).
Output Power (from HNB™)	25W Peak 4Ω per channel 12W RMS continuous 4Ω per channel.
Audio Performance	
Frequency Response	20Hz - 20kHz (± 1.5dB)
THD + N	≤ 1.0% at 1kHz rated output ≤ 0.1% at 1kHz at 10W 4Ω
Signal to Noise Ratio	90dB A-weighted (band pass: 20Hz-20kHz)
Channel Separation	60dB
Dynamic Range	100dB
Input Sensitivity & Impedance	Program: 0.775V, 10kΩ electronically balanced, with RF filter (ferrite).
***Outputs** (R + L)	4Ω (optimum) or 8Ω
Output Regulation	Less than 2dB, no load to full load at 1kHz.
Controls	'MO' audio level 0-1V POT. 'MO' voltage sensitivity 1V-70V POT. 'MO' delay (time sec) POT. Volume gain POTS on Preamp and Amp. Treble and bass POT. Power On/Off soft push button. Manual 'Duck' (1 to -50dB) for Mic input.
Controls-IR Remote	Volume (+/-, R+L), Mute, Balance (R+L), On/Off Redundant manual soft push buttons.
Video Performance	Supports VGA, SVGA, XGA and WXGA computer video to VESA standard. Supports NTSC, PAL and SECAM video standards. Output transmission via CAT5e meeting ANSI / EIA / TIA 568B standard. Operational bandwidth up to 350MHz. Horizontal frequency 15-126 kHz. Vertical frequency 43-200 Hz. Sync signal compatible with TTL level 5V / 3.3V. Power at 5VDC nominal from 24VDC/2.5A wall supply (HNB-A). Video differential gain / phase at +/- 2%. Attenuation loss rated at 6 dB at 1,000 feet at 1MHz typical UTP CAT5e. Maximum capacitance at 20pf/foot UTP.
Power Efficiency	<80% at 25W 4Ω, <85% @ 8Ω <90% at 10W 4Ω, <95% @ 8Ω
Power Consumption	32W / 9.5 btu @ 120VAC, 130ma nominal in 'Sleep' mode.
Operating Temperature	-10° to 40°C, 14 to 104°F
Storage Temperature	-20° to 65°C, -4 to 149°F
Input Connections	(3) Stereo/Mono inputs: 3-pin dockable, RCA and 3.5mm jack. (1) 3-pin dockable Mic or Audio line level (Stereo/Mono). (1) 2-pin dockable Security override closure (no polarity). (1) 2-pin dockable EAO Fire override closure (no polarity). (1) 2-pin dockable MO override input (+/-). (1) HD-15 VGA. (1) 4-pin Mini DIN S-video. (1) RCA Composite video.
Output Connections	(2) 2-pin dockable Speaker (R+L). (1) Audio line out (1V/600 Ohm). (1) RJ45 video out (HB-V) and video input (HB-VR). (3) RJ45 Audio/Power input and output between HNB-A + B. (1) IR LED remote 3.5mm jack. (1) Headphone 3.5mm jack. (1) HD-15 VGA, (1) Mini DIN S-video, (1) RCA C-video (HB-VR). (1) HD-15 VGA buffered Monitor (HB-V).
Internal Connections	(2) 2x6 socket connectors (HNB-A and HNB-B). (2) 3-pin header/jumper option (HNB-A).
Visual Indicators	Front LED video source active (green). Power LED for all plug-in modules (green). Internal LED for MO active (amber). Internal LEDs for power to each channel (green). Video signal present LEDs: VGA, S and C video (green). 4-character, 7-segment LED display for system setup and control.
Material	18 AWG steel / .047 nominal.
Finish	Zinc undercoat with white powder coat paint.
Dimensions:	Length 3.23" / 82mm (internal to EO box). Height 2.54" / 64.4mm (internal to EO box). Width 3.37" / 85.5mm (internal to EO box).
Weight (Product/shipping)	1.75 lbs. / 2.25 lbs. (HNB-A or HNB-B).

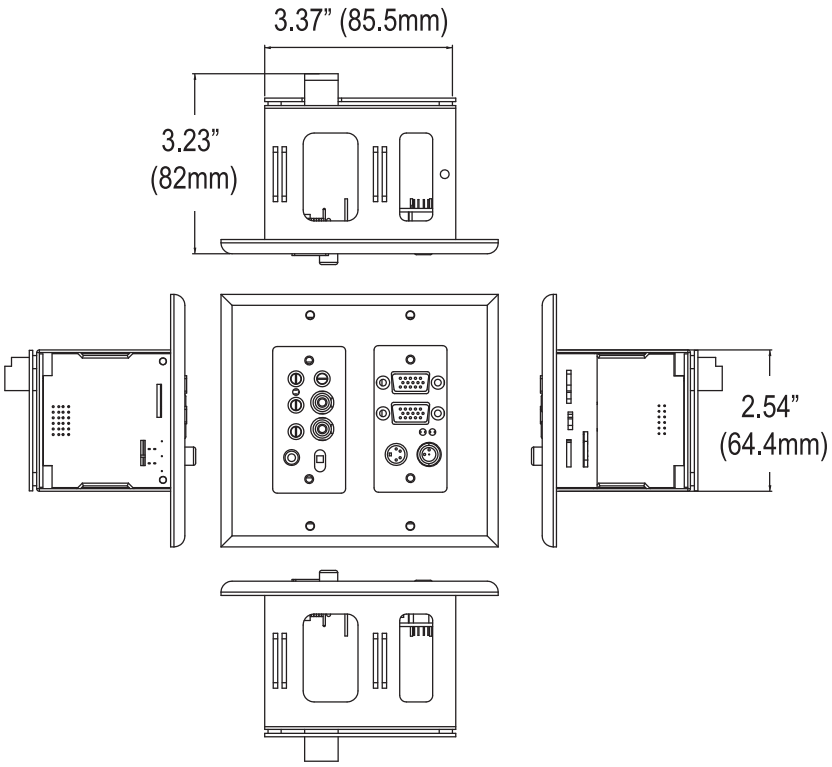
* Note: HNB can drive 25V-70V speakers with optional HNB-70V2X matching impedance transformer (see page 20, section 5.2)

2.2 Dimensions HNB-A and HNB-B

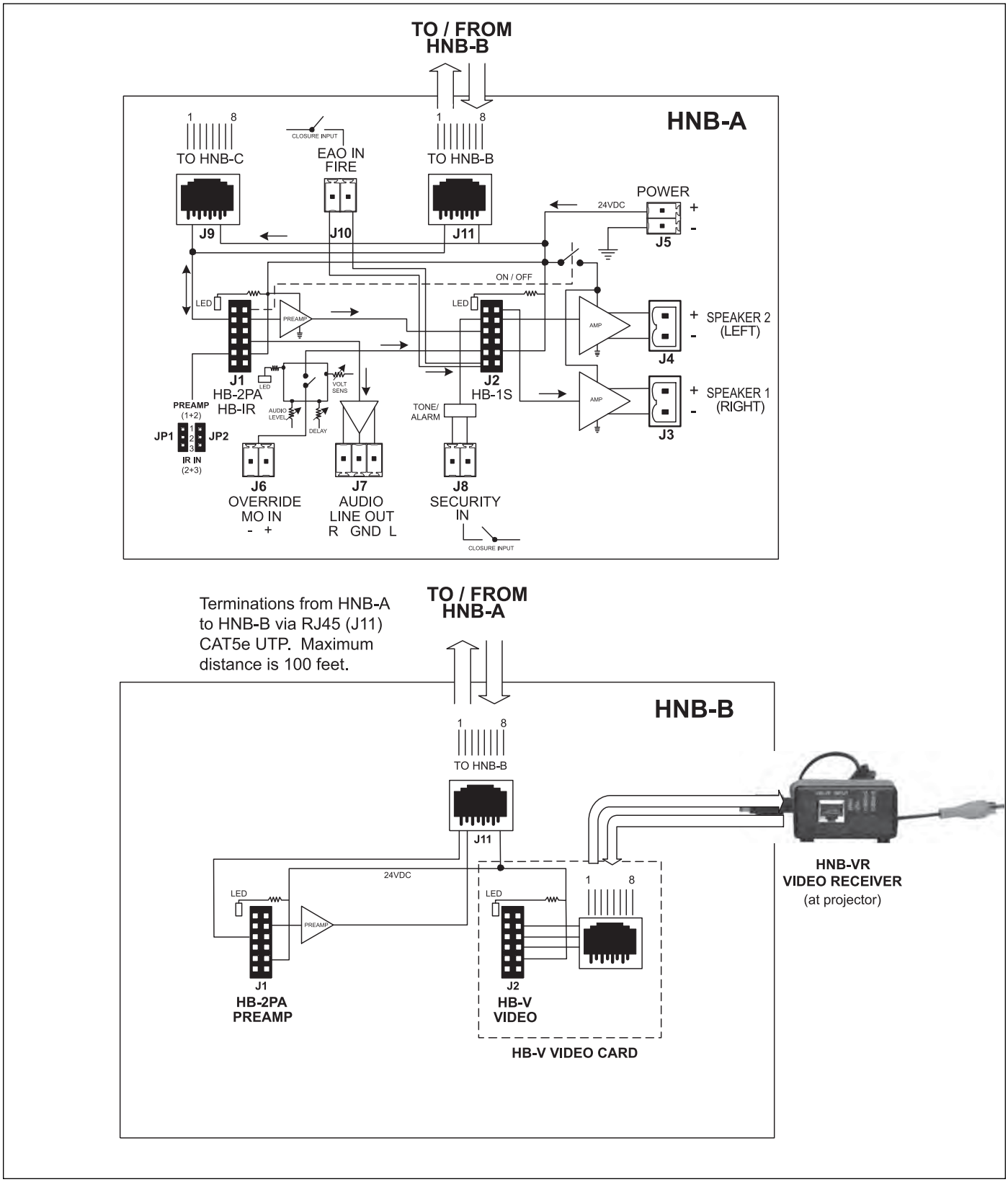
HNB-A
(shown without cover plate)



HNB-B
(shown with cover plate)

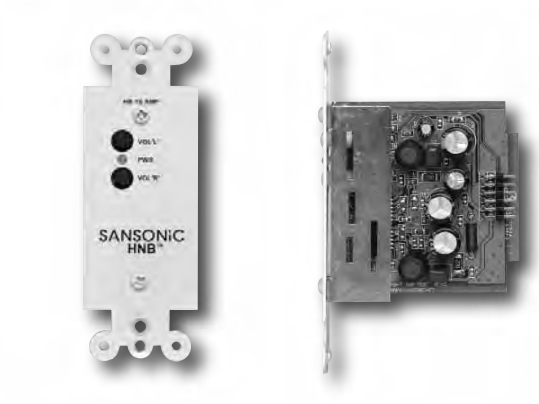


2.3 HNB-A + HNB-B Signal Flow Block Diagrams



SECTION 3.0 - HNB-A + HNB-B SYSTEM COMPONENTS

3.1 Plug-in Modules: Amplifier Module HB-1S



HB-1S
Front view

HB-1S
Side view

Use in HNB-A **RIGHT SLOT**

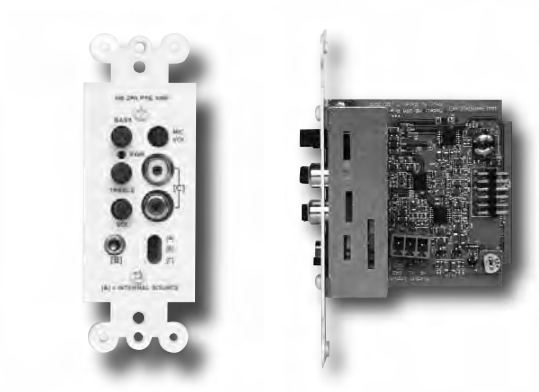
Amplifier Module (HB-1S)

The HNB amplifier module HB-1S is included with HNB-A. It always plugs into the **RIGHT SLOT** (**J2**) of HNB-A and provides high fidelity Stereo and Mono audio (digital class-D power) to any 4- or 8-ohm speakers. The HNB amplifier will support 70V speakers using Sansonic HNB-70V2X matching impedance transformer unit that may be ordered separately.

Module Features:

- Robust digital class-D architecture with better than 85% efficiency.
- Dual channel 25W into 4-ohm / 12W at 8-ohm operation.
- Mono or stereo operation with full bandwidth operation 20Hz - 20kHz.
- Fits into standard 2-gang electrical box (3.5”DEEP) with Decora wall plate.
- Automatic over current and over temperature protection.
- Manual front volume controls for R+L channels.
- IR control of each channel’s volume, bass, treble, balance (See HB-IR).
- Visible active power status LED’s for each channel (Green).
- Power 24VDC/2.5A from common UL wall power supply.

3.2 Plug-in Modules: Pre-amp Module HB-2PA



HB-2PA
Front view

HB-2PA
Side view

Use in HNB-A or HNB-B **LEFT SLOT**

Preamplifier Module (HB-2PA)

The HNB preamplifier module HB-2PA is an integrated, high fidelity audio mixer that can be used in the **LEFT SLOT** of **EITHER** the **HNB-A** or the **HNB-B** chassis. It provides multiple balanced line inputs at nominal 1V/600 ohm line level (A+B+C) via phoenix, RCA and 3.5mm connections that can be selected via IR remote control or a manual front slide switch.

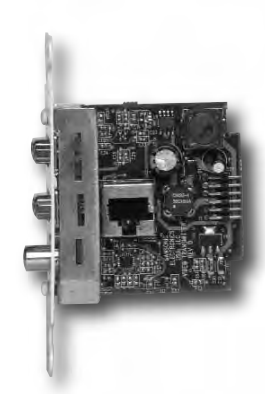
Audio inputs can be shaped for greater intelligibility via front accessible controls for treble, bass and volume. Inputs may be mono or stereo and are automatically routed to the HB-1S amplifier SPEAKER 1 (R) + SPEAKER 2 (L) and AUDIO LINE OUTPUT (J7) on the rear backplane. An internal audio input connection used for audio or microphone input has a ducking control (0dB to -50dB) which automatically ducks the ‘B’ + ‘C’ audio sources when voltage is present.

Module Features:

- Stereo or Mono operation at full bandwidth of 20Hz - 20kHz.
- Multiple audio source inputs via common phoenix, 3.5mm, RCA terminations.
- Audio source selection via front slide switch (A+B+C).
- Fits into standard 2-gang electrical box (3.5”DEEP) with Decora wall plate.
- AM/FM ‘RF’ and audible noise suppression.
- Signal to noise at 85dB and sensitivity at -16dBu.
- Manual front volume controls for audio and microphone channels.
- IR control of each channel’s volume, bass, treble, balance (see HB-IR).
- Visible active power status LED (Green).
- Power via HNB backplane at 24VDC/2.5A from common power supply.

3.3 Plug-in Modules: Video Module HB-V and HB-VR Video Receiver

HB-V
Front view



HB-V
Side view

Use in HNB-B **RIGHT SLOT**

Video Module (HB-V)

The HNB video module HB-V is an integrated high performance video input used to transmit VGA (RGB), Composite video and S-video signals to its companion HB-VR receiver unit. HB-V provides a fully integrated and buffered 'loop through' monitor output to support desktop applications. Common connectors are utilized: DB-15HD, RCA and DIN. Video signal transmission is achieved via a single RJ45-CAT5e UTP cable to the HB-VR receiver up to 150 feet / 45 meters between the HB-V and the HB-VR units. Power and 'Signal Present' green LEDs are utilized at both 'Transmit' and 'Receive' ends.

Module Features:

- Supports multiple video source inputs: VGA, Composite video, S-video.
- Override priority to 'Video' inputs allows simultaneous use with VGA source.
- Fits into standard 2-gang electrical box (3.5"DEEP) with Decora wall plate.
- AM/FM 'RF' and audible noise suppression.
- Signal to noise at 85dB and sensitivity at -16dBu.
- Video transmission via CAT5e UTP up to 150' / 45M wired per EIA/TIA 568B.
- Operational bandwidth up to 350MHz.
- Video differential gain / phase at 2%.
- Attenuation loss at 1dB at 300' at 1MHz.
- Maximum capacitance at 20pf/foot UTP and 75-100 ohm impedance matching.
- Visible active 'Power' status and 'Video Signal' LEDs (Green).
- Power 5V nominal via HNB-A at 24VDC/2.5A from common power supply.

HB-VR
Front view

HB-VR
Side view

Use at **AV Projector**

Video Receiver (HB-VR)

The HNB video receiver HB-VR is an integrated high performance video receiver used to receive VGA (RGB), composite video and s-video signals from its companion HB-V transmit module. HB-VR provides high performance impedance matching of video to the projector in VGA, composite and s-video formats. Common connectors are utilized: DB-15 HD, RCA, and DIN. Video signal transmission is achieved via a single RJ45-CAT5e UTP cable from the HB-V module up to 150 feet / 45 meters between the HB-V and HB-VR units. Visible 'Power' and 'Signal Present' Green LEDs are utilized to support easy installation and trouble shooting.

Receiver Features:

- Supports multiple video source inputs: VGA, composite video, S-video.
- Provides convenient discrete VGA, S-video and composite cables for direct connection to AV projectors.
- Override priority to 'Video' inputs allows simultaneous use with VGA source.
- Compact plastic housing for easy mounting at the projector.
- AM/FM 'RF' and audible noise suppression.
- Signal to noise at 85dB and sensitivity at -16dBu.
- Transmission via single CAT5e UTP cable up to 150' / 45M wired per EIA/TIA 568B.
- Operational bandwidth up to 350MHz.
- Video differential gain / phase at 2%.
- Attenuation loss at 1dB at 300' at 1MHz.
- Maximum capacitance at 20pf/foot UTP and 75-100 ohm impedance matching.
- Visible active 'Power' status and 'Video Signal' LEDs (Green).
- Power 5V nominal via HNB-A at 24VDC/2.5A from common power supply.

3.4 Plug-in Modules: IR Module HB-IR and HB-IRRC Remote Control

HB-IR
Front view

HB-IR
Side view

Use in HNB-A **LEFT SLOT**

HB-IRRC
Front view

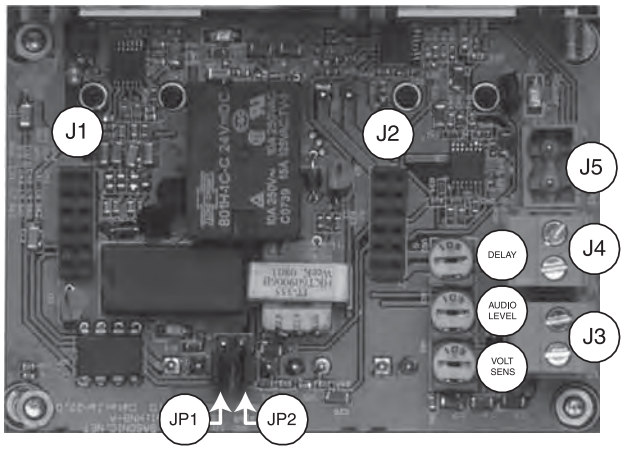
IR Module (HB-IR)

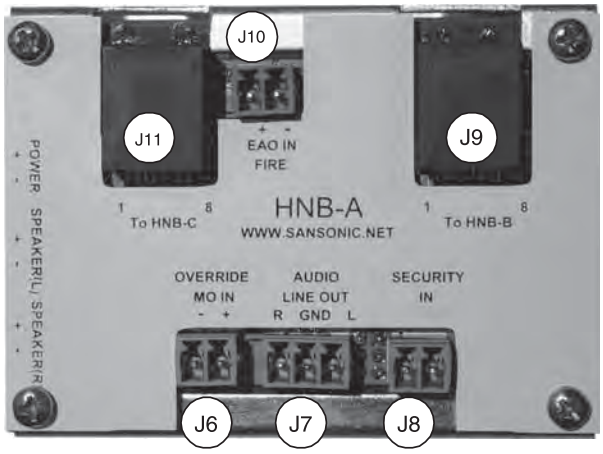
The HNB IR module HB-IR is an integrated high performance infrared dual channel micro-controlled receiving module that is operational up to 50 feet / 15 meters to control and shape HNB audio. Note: When the HB-IR module is used it MUST insert into the **HNB-A LEFT SLOT** next to the HB-1S amplifier module.

Module / Remote Features:

- High visibility 4-character, 7-segment LED display.
- Fits into standard 2-gang electrical box (3.5”D) with Decora wall plate.
- Multi-function micro control operation for bass, treble, balance, volume, mute, on/off.
- Visible active ‘Power’ status LED (Green).
- Power 5V nominal via HNB-A at 24VDC/2.5A from common power supply.
- Durable hand-held remote control using common AA batteries.
- Full operation up to 50 feet / 15 meters at 45 degree off axis.
- Controls for Power, Volume +/-, Select Input (1, 2, 3), Mute All.
- 3.5mm mini jack for Headphone.
- Manual soft push buttons for controlling On/Off, Volume (+/-).

3.5 HNB-A Chassis FRONT and REAR





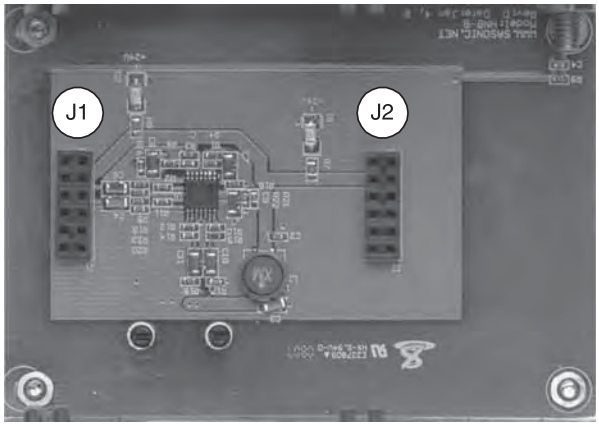
HNB-A Chassis Front

J1 .....HB 'LEFT module slot (HB-2PA preamp or HB-IR)
J2 .....HB 'RIGHT' module slot (HB-1S amp)
J3 .....Speaker 1 (Right) output
J4 .....Speaker 2 (Left) output
J5 .....Power input (24VDC/2.5A)
JP1 .....Jumper/Header option (Preamp 1+2 or IR 2+3)
JP2 .....Jumper/Header option (Preamp 1+2 or IR 2+3)
Delay.....Delay time for 'MO' override
Audio Level ..Audio level control for 'MO' override
Volt Sens .....Voltage sensitivity 1V-70V for 'MO' override

HNB-A Chassis Rear

J6 .....'MO' Master Override input +/- 1V to 70V
J7 .....Audio line out / L+R, Ground: 1V-600ohm nominal
J8 .....Security input / Contact closure
J9 .....Main control I/O to HNB-B unit / CAT5e UTP up to 100'/40M
J10 .....'EAO' Emergency Audio OFF from Fire System /
.....Contact closure
J11 .....Interface I/O to HNB-C unit / CAT5e UTP up to 100'/33M

3.6 HNB-B Chassis FRONT and REAR



HNB-B Chassis Front

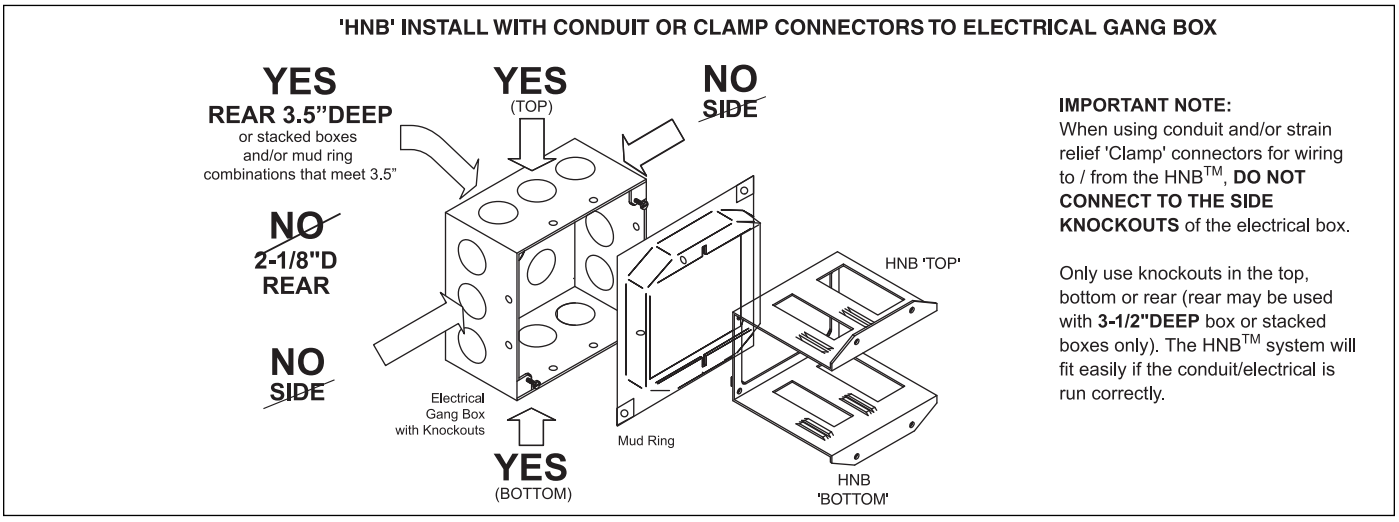
J1 .....HB 'LEFT module slot (HB-2PA preamp)
J2 .....HB 'RIGHT' module slot (HB-V video)

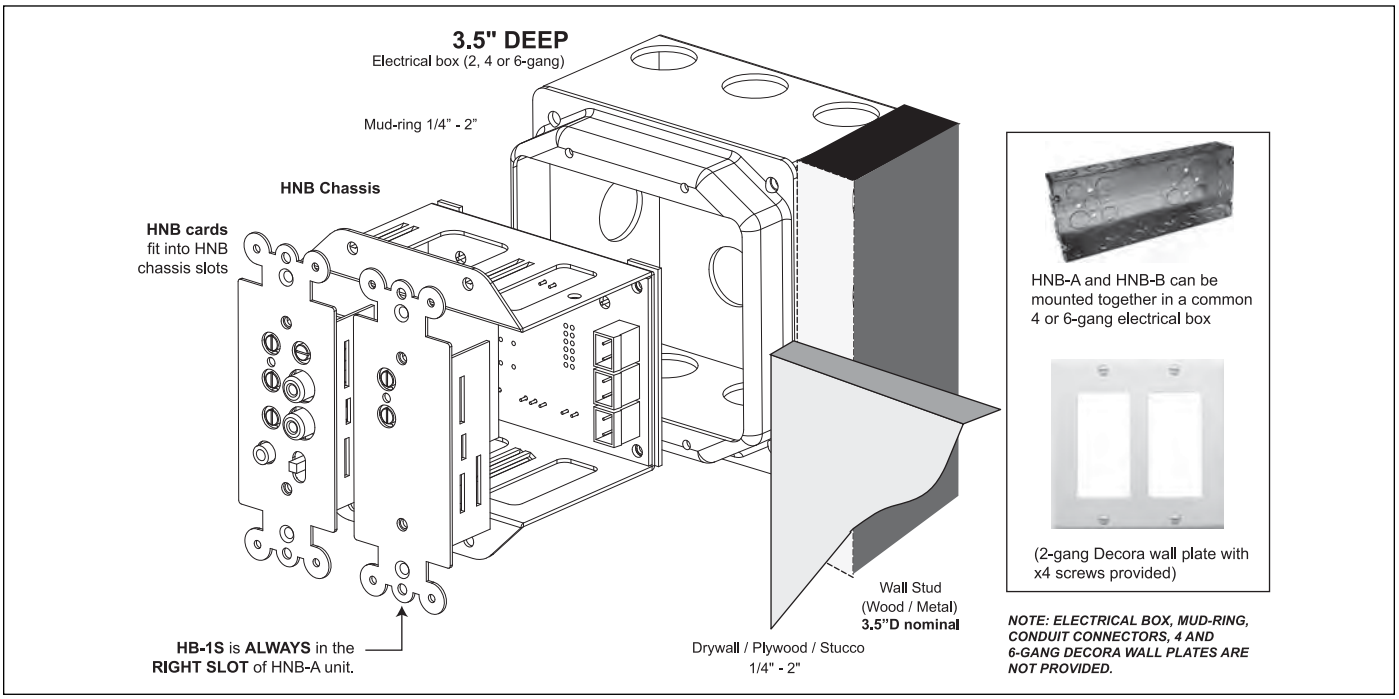
HNB-B Chassis Rear

J3 .....Interface I/O to HNB-A unit / CAT5e UTP up to 100'/33M

SECTION 4.0 - HNB-A + HNB-B INSTALLATION

4.1 In-wall / In-ceiling installation: 3.5” Deep Electrical Box (2, 4, or 6 gang)





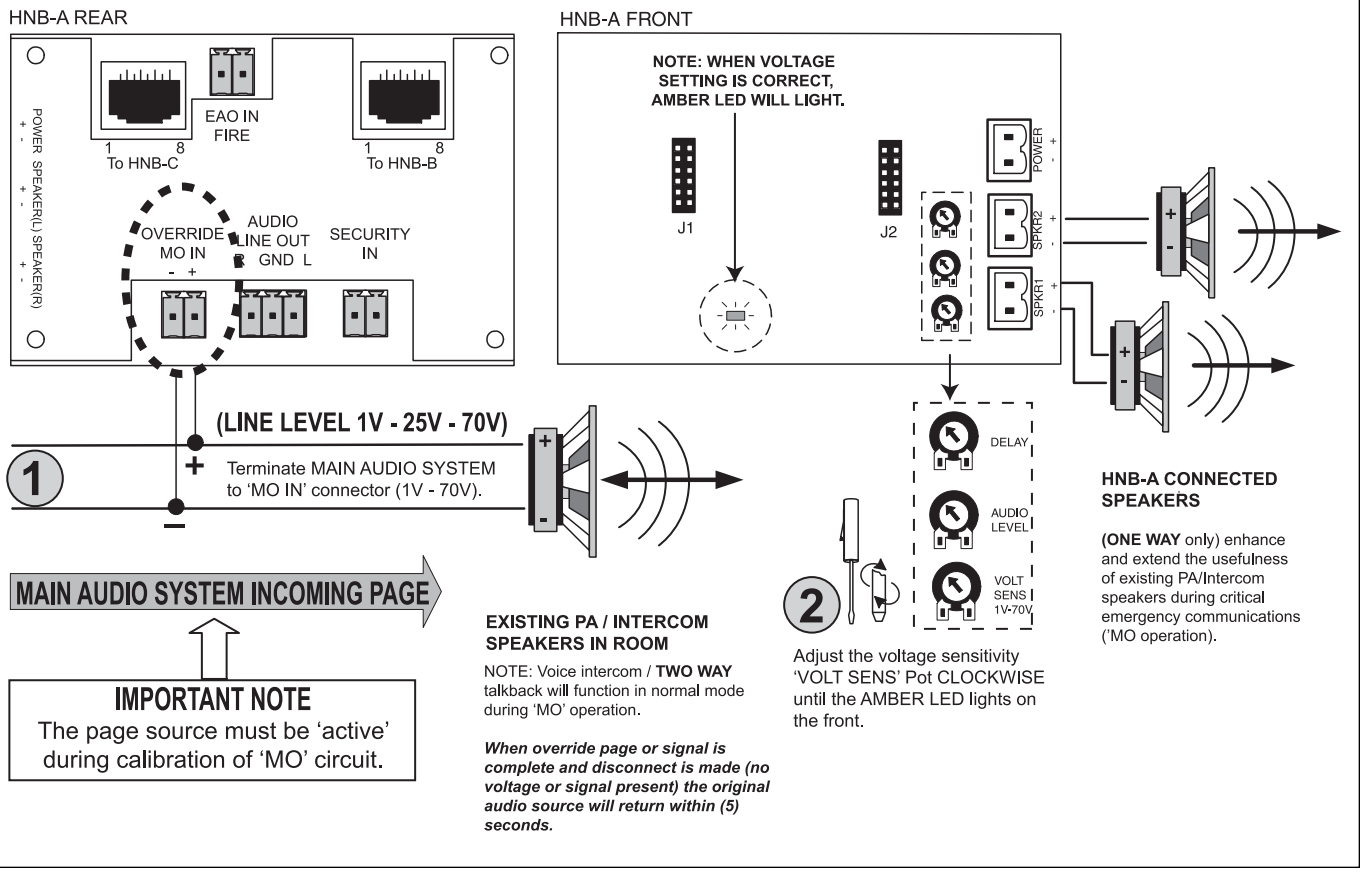
4.2 Accessories (by others) - Determine which accessories will be required.

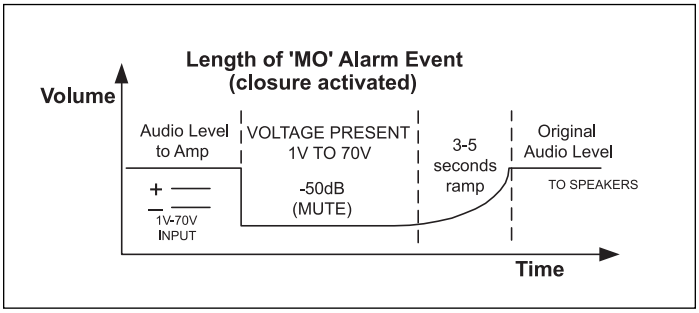
Electrical Outlet Box	4” Square x 3.5” DEEP is required for HNB-A, B, or C units. See RACO (www.hubbell-raco.com) models; #255 or #256 (or equivalent) for UL / NEMA rated box. You may “stack” electrical boxes or utilize appropriate Mud-ring to achieve 3.5” DEEP within the electrical box (refer to Raco #781 or #795 at 1.25” – 1.5”). Depending upon the AHJ or local building code you may utilize a 2-gang ‘LVF’ (low voltage frame) for Class 2 wiring devices.
Mud Ring	4” square / 2-gang opening at least 1.0” or greater as needed (see Electrical Outlet box above).
Conduit	EMT, rigid or flex conduit may be required, for ceiling or wall installations, to meet local building codes or authority having jurisdiction (AHJ) requirements. NOTE: CONDUIT MUST ENTER THE E.O. BOX PER DIAGRAM (above) FOR PROPER FIT.
Speaker Wiring	16-18 AWG ‘TWISTED pair’ recommended.
Ceiling Support	In-ceiling installation MUST have adequate HNB™ support above the suspended ceiling grid system and needs to follow local building codes and utilize a hanger assembly such as Erico/CADDY UL listed models 512HD or 512HDXT or equivalent.
Electrical Outlet Box	Codes may require the power supply be mounted in a 4-gang standard or plenum E.O. box (RACO #943 or equivalent).

4.3 HNB-A Master Override Input Connection, Adjustment and Operation

1. Terminate MAIN AUDIO SYSTEM to 'MO IN' 2-pin connector (1V - 70V) on rear panel.
When 'MO IN' is terminated all audio sources to INPUTS 1-4 will instantly shut down (-50dB).

2. Adjust the voltage sensitivity 'VOLT SENS' Pot CLOCKWISE until the AMBER LED lights on the front panel.
Proceed to adjust AUDIO LEVEL and DELAY Pots as needed to match PA and intercom performance needs.
IMPORTANT NOTE: The PAGE SOURCE must be ACTIVE during set up.



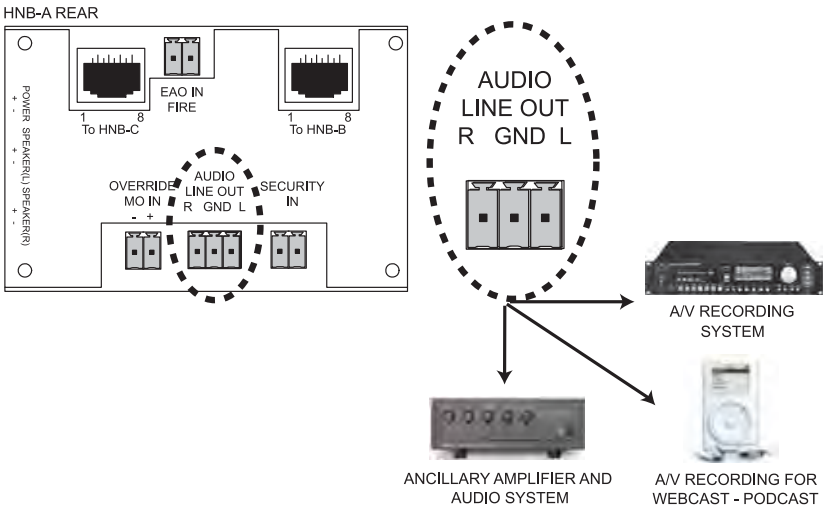


'MO' Master Override initiates an automatic 'MUTE' at 10ms attack and release at 3-5 seconds of **ALL** HNB audio sources.

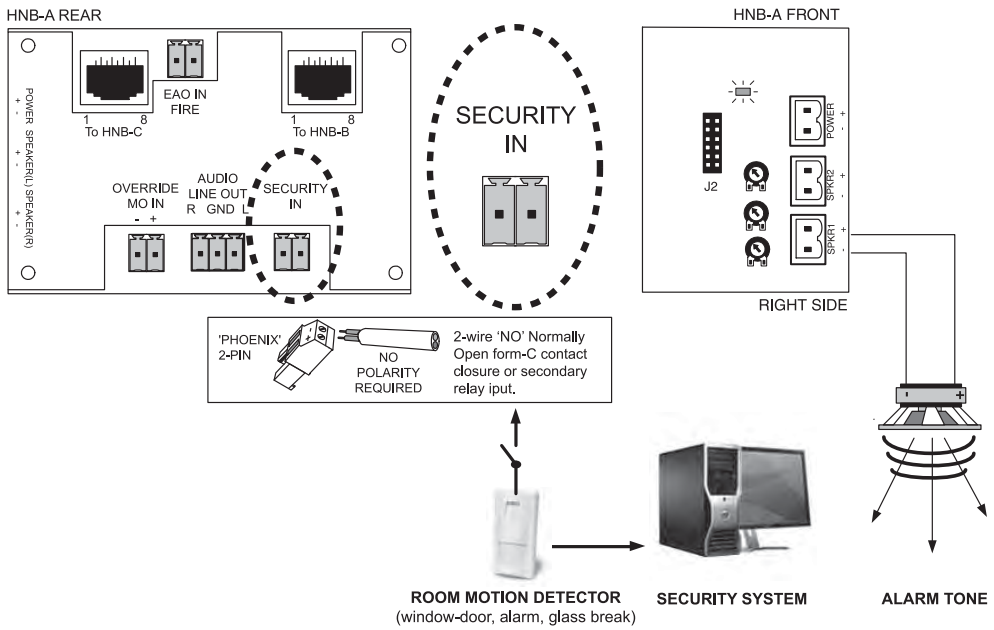
Note: When 'MO' is activated and 'Voltage Present' is detected on the 'MO' 'J6' input (see section 3.6), all audio sources to HB-2PA preamp are immediately 'MUTED' to the amp and speakers.

Only the 'MO' audio signal routes to the amp and is broadcast to speakers during 'MO' activation. The 'MO' input audio level **IS ADJUSTABLE** and can be different than the original source material.

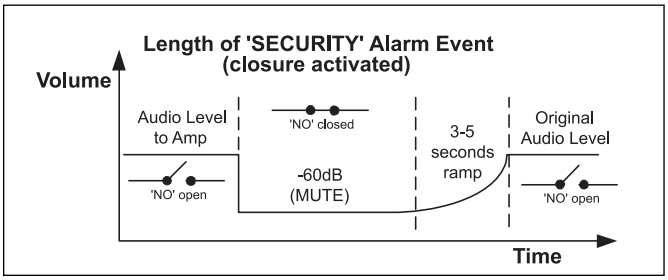
4.4 HNB-A Audio Line Output: (1V, 600ohm, -10db nominal, Mono or Stereo)



4.5 HNB-A Security Input and Automatic Alarm Activation



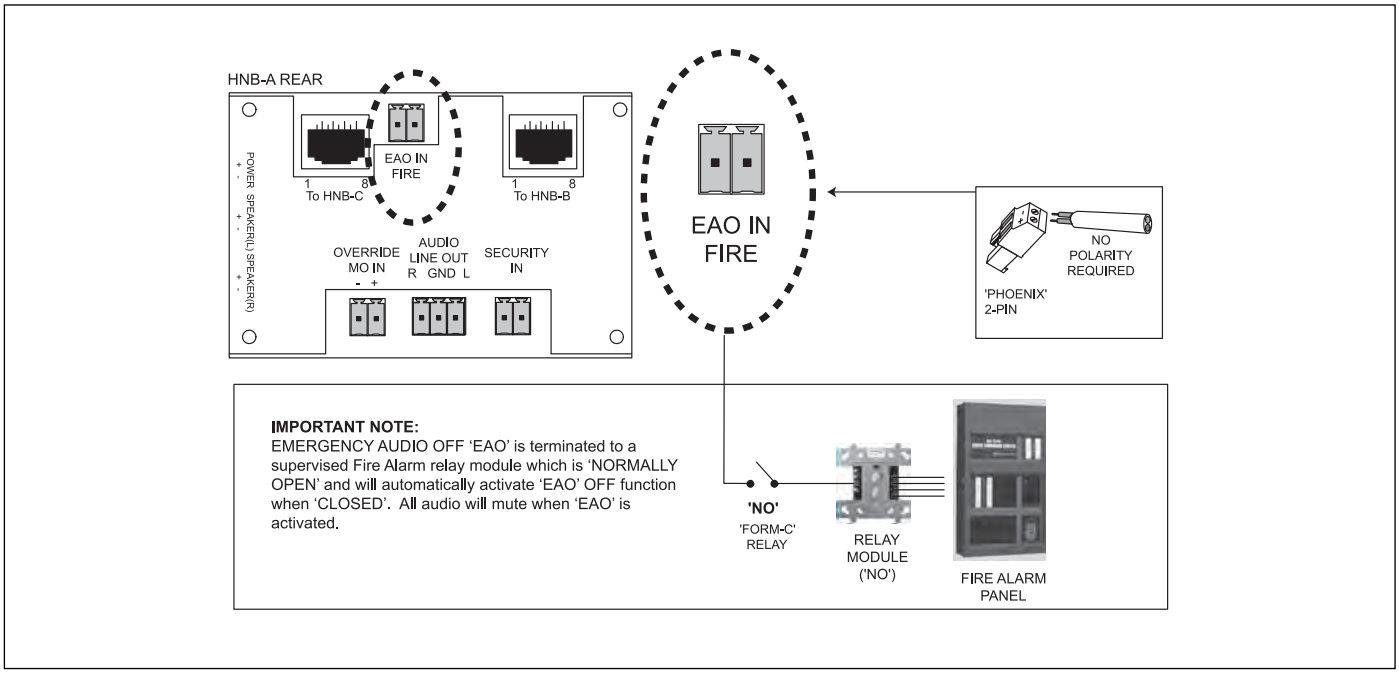
Security input activation will trigger automatic audible alarm as priority and mute off all audio sources during alarm condition. Once activation is removed, original audio source will return within 3-5 seconds.

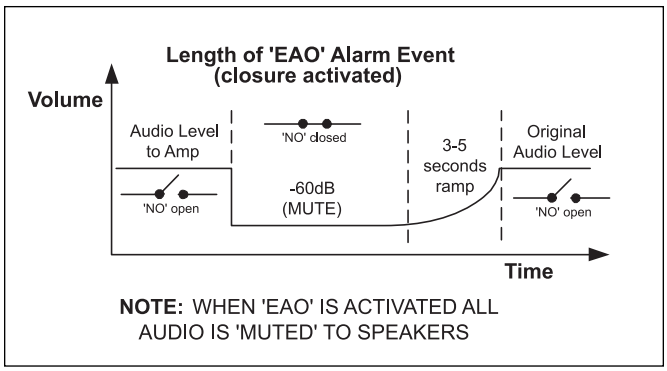


Security Override initiates an automatic 'MUTE' at 10ms attack and release at 3-5 seconds of **ALL** HNB audio sources.

Note: When '**Security**' '**J8**' closure is activated all original audio sources are automatically 'MUTED' to the amp and speakers and replaced by the on-board alarm tone. The security alarm tone level is common with the original HNB level settings and does not have a separate adjustment capability.

4.6 HNB-A Emergency Audio OFF 'EAO'





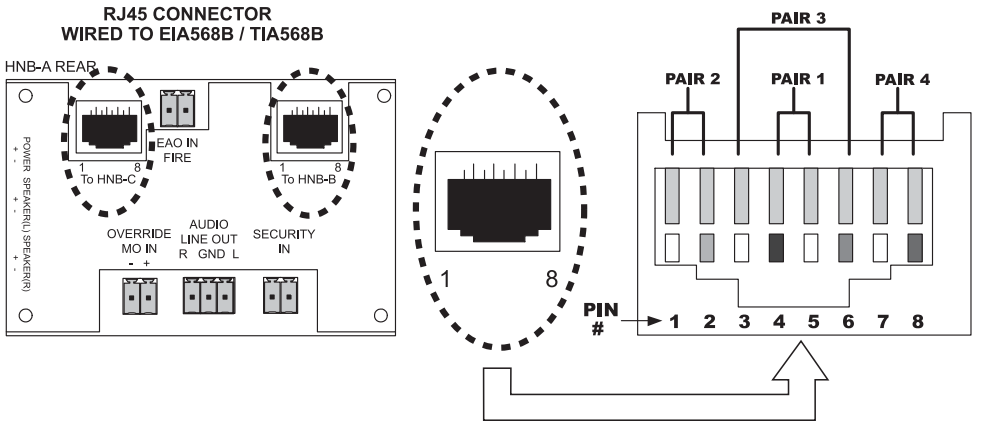
Emergency Audio Off 'EAO' Automatic 'MUTE' at 10ms attack and release at 3-5 seconds of **ALL** HNB Audio sources.

The 'EAO' circuit connects to a 'Normally Open' relay from a **supervised fire panel** and will automatically MUTE all audio output from the HNB-A unit. When this relay opens and power is removed, the original audio source will return.

Note: 'EAO' is a '2-wire' connection which is NOT polarity sensitive.

Note: 'EAO' termination is to **RED 'Phoenix' 2-pin** connector.

4.7 HNB-A RJ45 Connector Color Codes

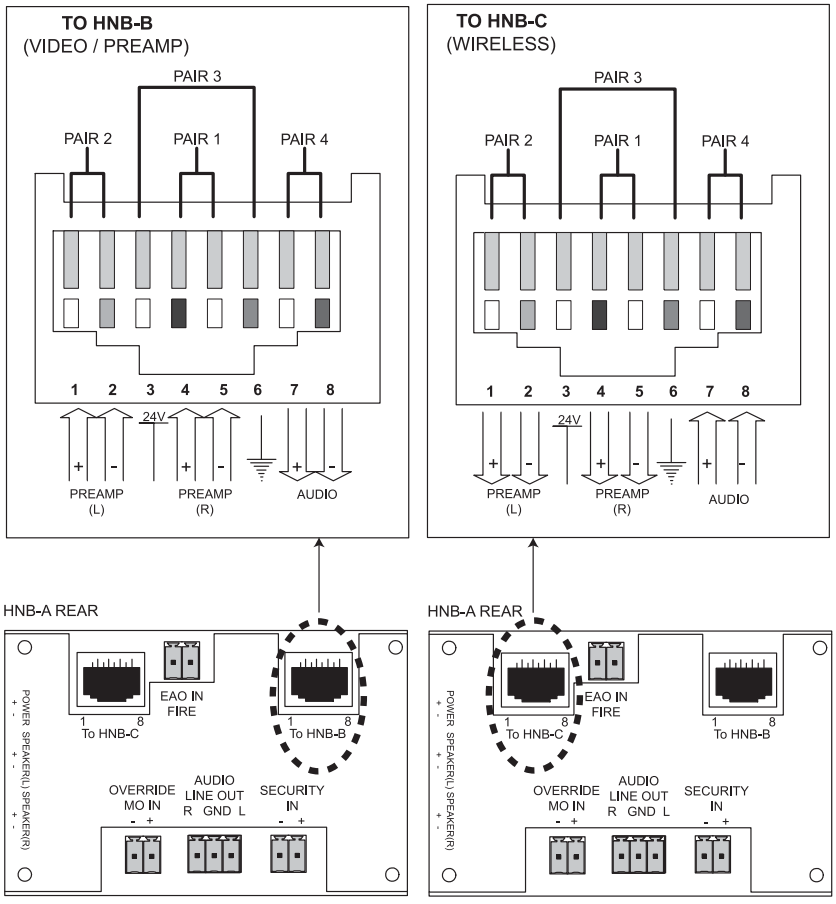


COLOR CODE I - 8 / CAT5e UTP cable

PAIR 1 = BLUE (4) + BLUE STRIPE (5)
PAIR 2 = ORANGE (1) + ORANGE STRIPE (2)
PAIR 3 = GREEN (6) + GREEN STRIPE (3)
PAIR 4 = BROWN (8) + BROWN STRIPE (7)

4.8 **Terminations:** HNB-A to HNB-B (HNB-C)

Note: Wiring between HNB-A, HNB-B, and HNB-C units is accomplished via CAT5e UTP cabling which is operational up to 100 feet between units. Wiring must meet industry standards per the ANSI/EIA/TIA 568B specification latest issue. Additional information can be located at the following websites: ansi.org, eia.org and tiaonline.org.

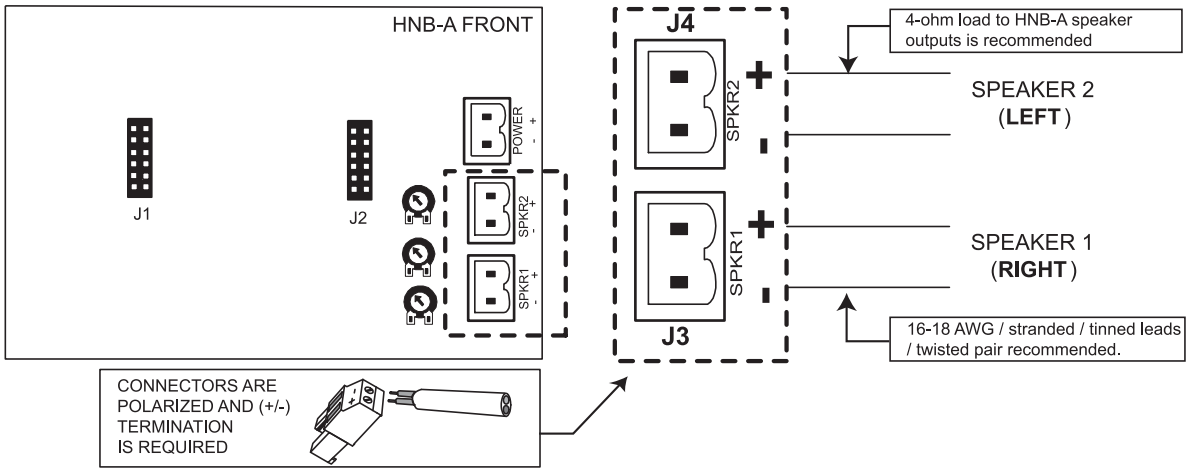


Terminations from HNB-A to HNB-B (or HNB-A to HNB-C)
are via RJ45 (J11) CAT5e UTP cable. Maximum length between units is 100 feet.

SECTION 5.0 - HNB-A + HNB-B SPEAKER WIRING

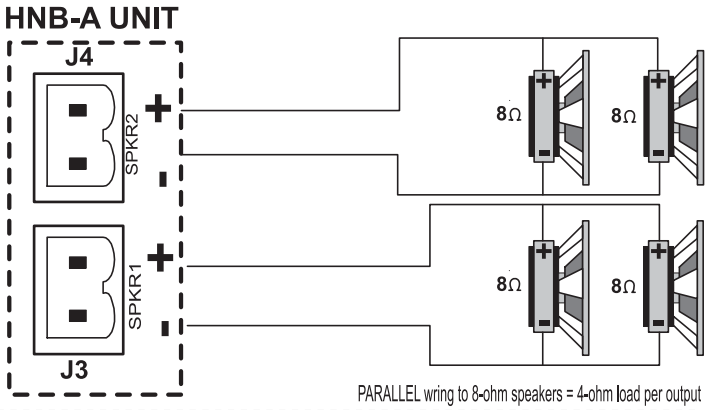
5.1 HNB-A output connections for speaker wiring

- HNB-A supports **MONO** or **STEREO** operation.
- HNB-A provides amplifier power to speakers via **J3** (speaker 1 / RIGHT) and **J4** (speaker 2 LEFT).
- Load to HNB-A '**J3'** and 'J4' should not go below 4-ohms.



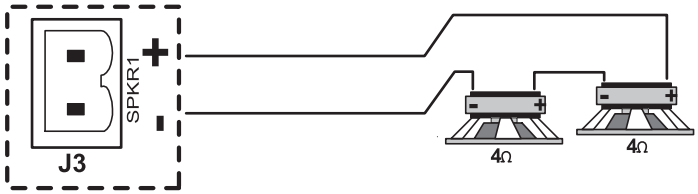
HNB-A is a Class-2 low voltage device

PARALLEL wiring to 8-ohm speakers (x2) creating a 4-ohm load to the amplifier per channel.



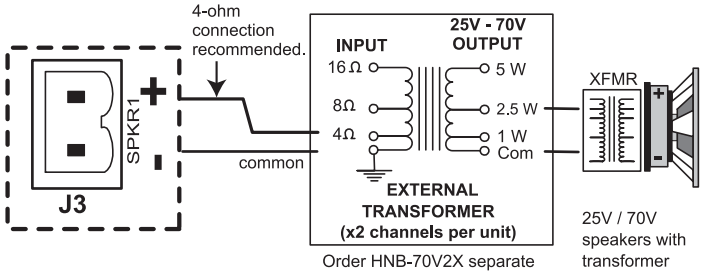
or

SERIES wiring to 4-ohm speakers = 8-ohm load per channel.



or

Wiring to 25V - 70V speakers with external matching impedance transformer Model HNB-70V2X. See page 20, section 5.2

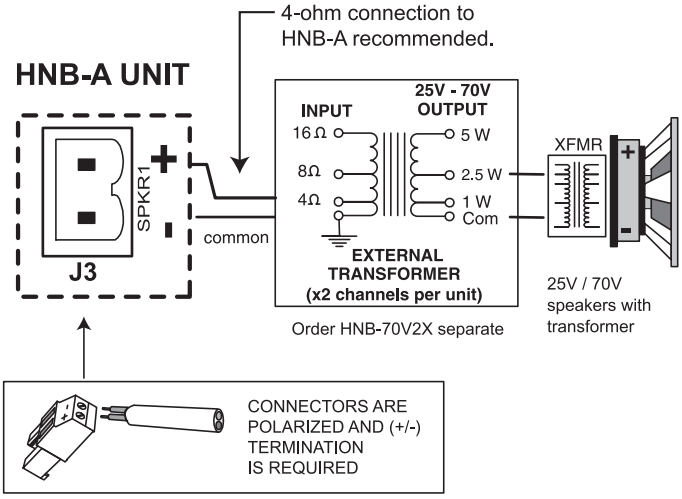


5.2 HNB-70V2X Impedance Matching Transformer (optional) for use with 25V-70V speakers

Shown open

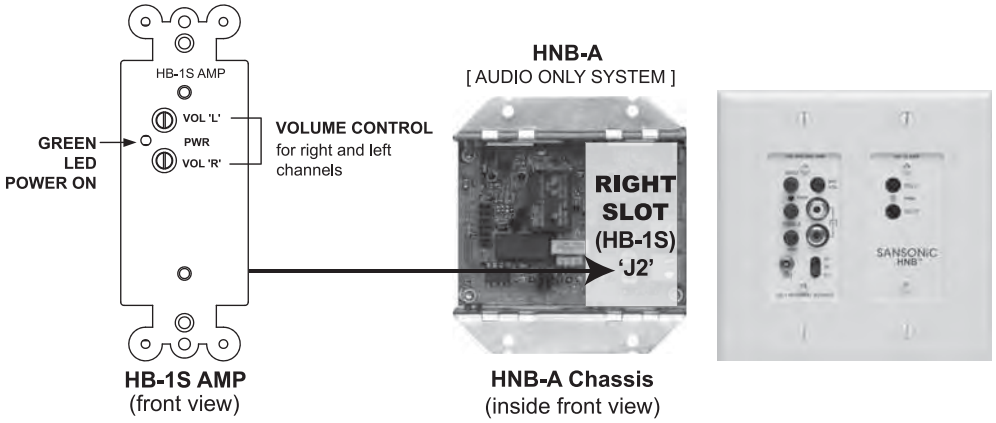
Shown with top cover plate

HNB-70V2X has high performance 30W matching impedance transformers capable of driving 25V or 70V speakers. Ready-to-install assembly is housed in a metal UL-CUL approved electrical junction box with ¾" – 1" electrical knockouts on all (4) sides with grounding screw, top cover plate with corrosion resistant powder coat grey paint and comes with electrical wire nuts for 16-18 AWG stranded cable connections.The HNB-70V2X two-channel transformer is ordered separately.



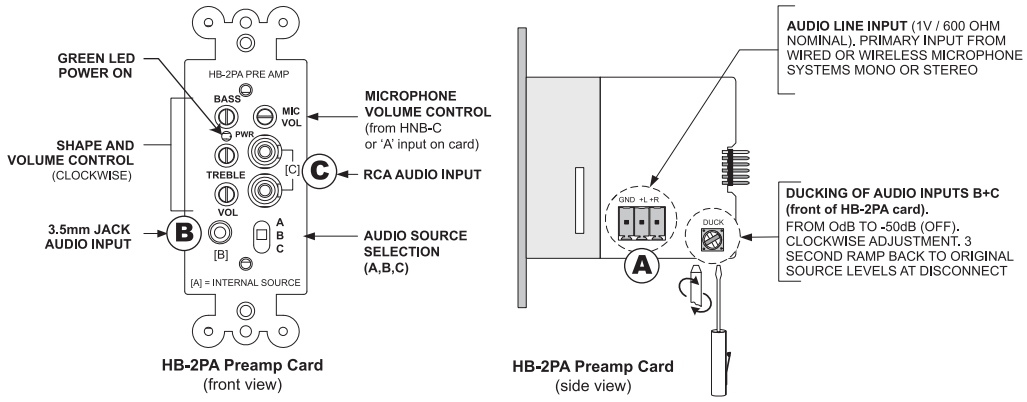
SECTION 6.0 - HNB-A + HNB-B MODULE CONNECTIONS AND ADJUSTMENT

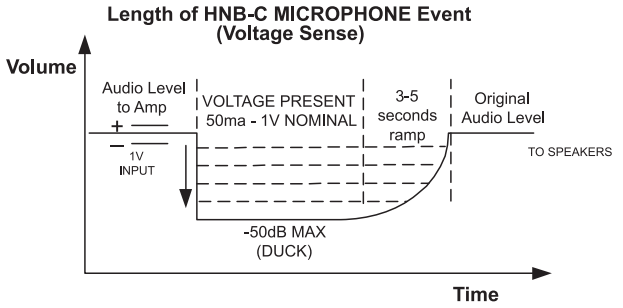
6.1 HB-1S Amp card: Adjustment and Location



Note: **HB-1S** Amp card **ALWAYS** fits into the **RIGHT SLOT** of HNB-A unit.

6.2 HB-2PA Preamp card: Input Adjustment, DUCK override adjustment, Location

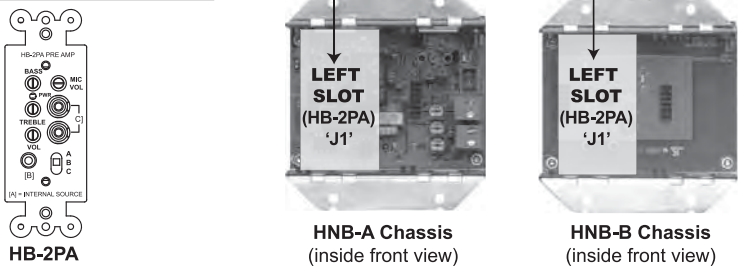




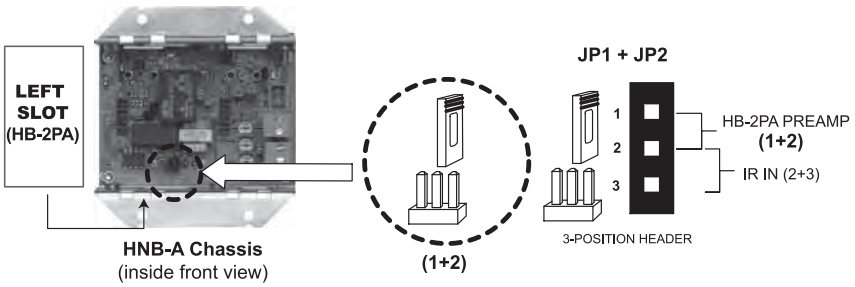
HB-2PA 'DUCK' Override initiates an automatic 'DUCK' of the HNB-B audio sources (B+C on Front) and is adjustable from 0dB to -50dB (Off) at 10ms attack time when signal is detected and releases at 3-5 seconds when signal is removed. This is an internal screwdriver manual 'POT' adjustment on the HB-2PA and is not normally end-user accessible.

Note: When the internal audio line input is activated and 'Voltage Present' is detected, all audio sources (B + C) to HB-2PA are immediately 'DUCKED' to the amp and speakers. The audio line signal routes to the amp and is broadcast to speakers 'ON TOP' of the original audio source. The input audio level IS ADJUSTABLE and can be set different than the original source material.

Note: **HB-2PA** Preamp card **ALWAYS** fits into the **LEFT SLOT** of either HNB-A or HNB-B units

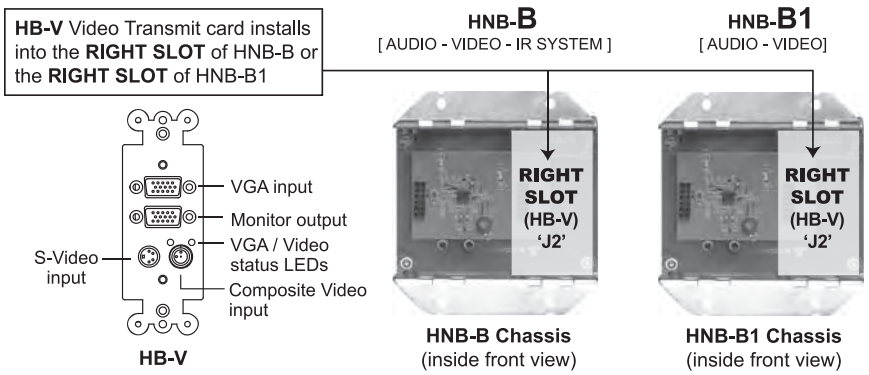


IMPORTANT NOTE: Whenever the HNB-A is combined with HNB-B and the IR Remote Control function is utilized **the HB-2PA Preamp module MUST MOVE to the HNB-B unit LEFT SLOT.**



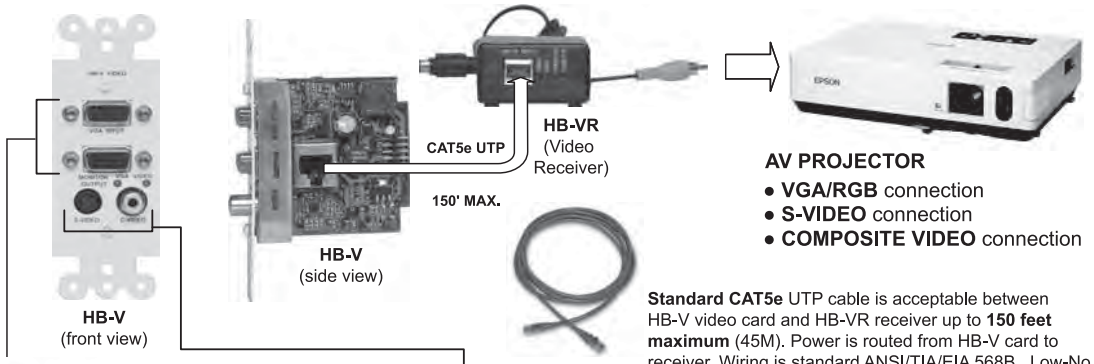
IMPORTANT NOTE: The jumper **MUST be in the 1+2 position of JP1 and JP2** when the HB-2PA preamp card is used in HNB-A (LEFT SLOT, 'J1'),

6.3 HB-V video card: Location



IMPORTANT NOTE: The HB-V card always installs in the **RIGHT SLOT** of HNB-B or HNB-B1.

6.4 HB-V video card + HB-VR receiver: Connections



Standard CAT5e UTP cable is acceptable between HB-V video card and HB-VR receiver up to **150 feet maximum** (45M). Power is routed from HB-V card to receiver. Wiring is standard ANSI/TIA/EIA 568B. Low-No skew or Shielded CAT5 cabling can be used and may improve video transmission performance.

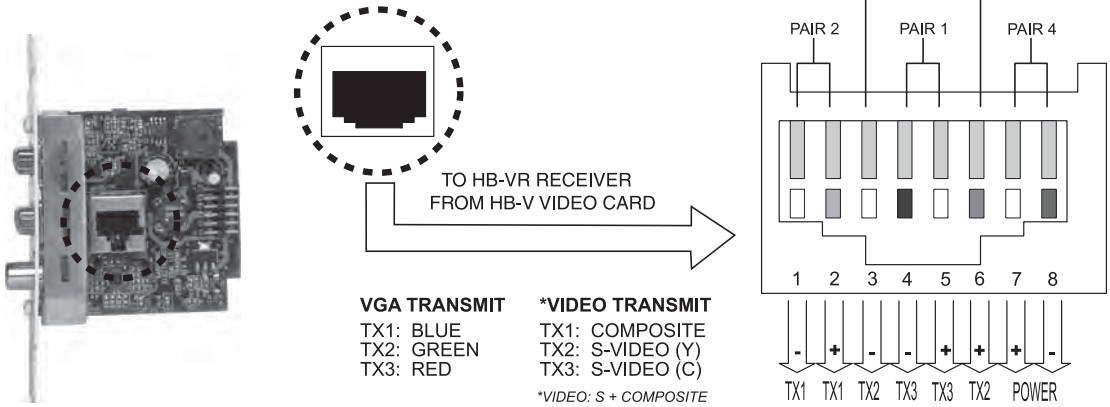
COMPUTER SOURCES

PC workstation with monitor or laptop PC VGA/RGB connection to **VGA INPUT.** 'Buffered' MONITOR OUTPUT is available for desktop application.

S-VIDEO AND COMPOSITE VIDEO SOURCES

Important Note: When both VGA/RGB (computer) and video sources (S-video or composite video) are connected and in 'Play' mode; the 'video' source will have priority to the projector. When the 'S' or 'C' video source is removed (off or stop) the VGA/RGB source will transmit to the projector.

RJ45 termination:
HB-V transmit to HB-VR receive

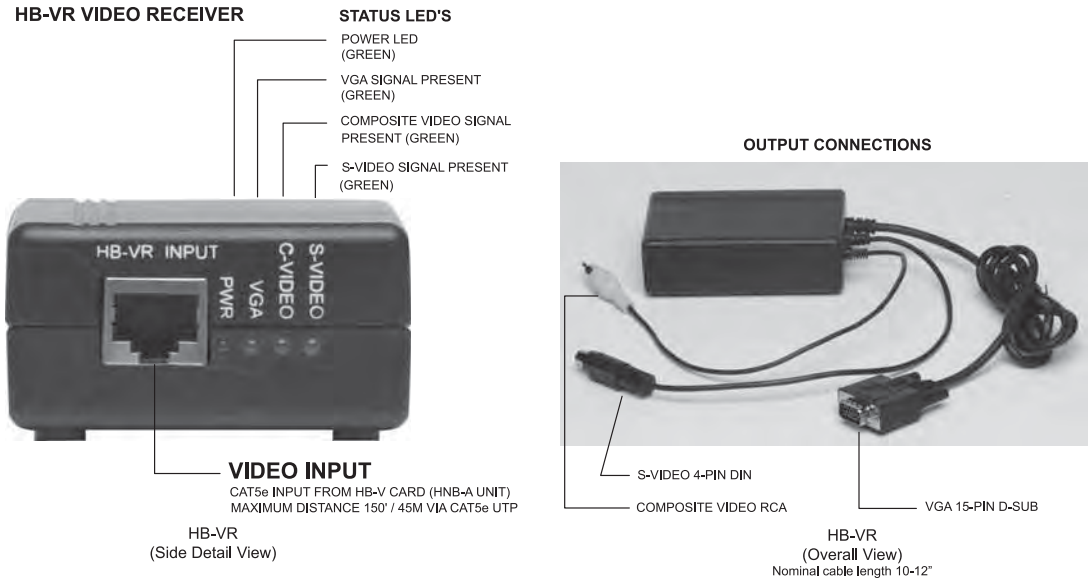


VGA TRANSMIT
TX1: BLUE
TX2: GREEN
TX3: RED

***VIDEO TRANSMIT**
TX1: COMPOSITE
TX2: S-VIDEO (Y)
TX3: S-VIDEO (C)

**VIDEO: S + COMPOSITE*

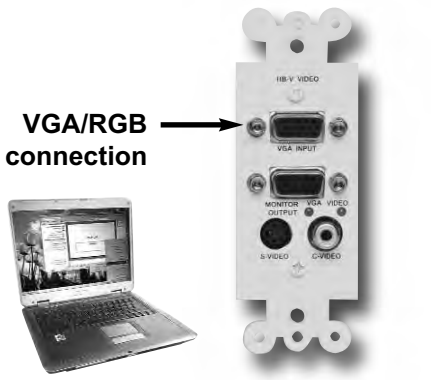
6.5 HB-V video card + HB-VR receiver: Operation



Wiring per ANSI/TIA/EIA 568B specifications.

After the RJ45/CAT5e cable is terminated and video signal and power are detected, the LEDs will immediately light provided cabling is correct. LEDs will light on both the HB-V video transmission card and the HB-VR receiver simultaneously.

6.6 HB-V video card + HB-VR receiver: Computer set-up



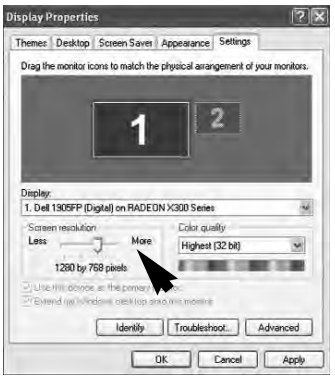
The HB-V video card and HB-VR receiver are designed to work with a PC workstation/monitor or a laptop PC. The computer connects to the HB-V video card using a high performance VGA/RGB cable/connector to the 'VGA' INPUT'. If a desktop workstation is used; connect the VGA MONITOR output via a high quality cable to the monitor.

Performance of the HB-V video card with a computer 'VGA/RGB' input requires proper resolution alignment of computer systems settings.The optimum screen resolution is 1024 x 768.Screen resolution of 1280 x 768 or 800 x 600 may also be used. To check or change your computer's screen resolution, please see below.

TIP: Use high quality VGA computer interface cables to improve resolution performance.

Go to the computer DESKTOP WINDOW screen and '**RIGHT CLICK**' your mouse to bring up the above dialog box. **LEFT CLICK on 'PROPERTIES**'.

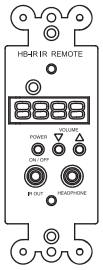
The above dialog box '**DISPLAY PROPERTIES**' will open. Choose the **SETTINGS**' menu tab in the upper right corner.



The above dialog box will appear providing settings options. Select '**SCREEN RESOLUTION**' and CHOOSE: 1280 x 768 or 1024 x 768 (optimum for HNB), or 800 x 600.

6.7 HB-IR IR Control Card: Location and Adjustment

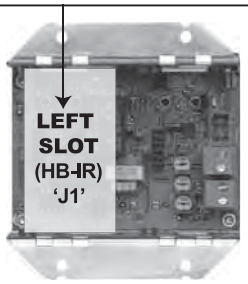
Note: HB-IR IR Remote Control card installs into the LEFT SLOT of HNB-A and the HB-2PA moves to the LEFT SLOT of HNB-B.



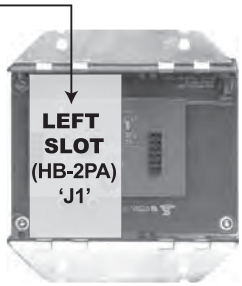
HB-IR

HNB-A
[AUDIO ONLY SYSTEM]

HNB-B
[AUDIO - VIDEO - IR SYSTEM]

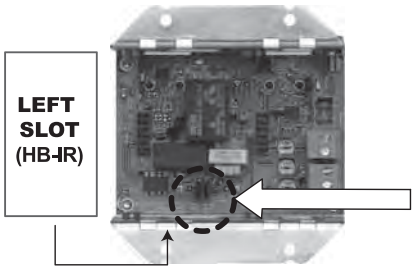


HNB-A Chassis
(inside front view)

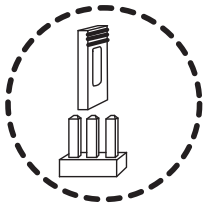


HNB-B Chassis
(inside front view)

IMPORTANT NOTE: Whenever the HNB-A is combined with HNB-B and the IR Remote Control function is utilized; the HB-2PA Preamp module MUST MOVE to the HNB-B unit LEFT SLOT and the HB-IR IR module installs in the LEFT slot of HNB-A.

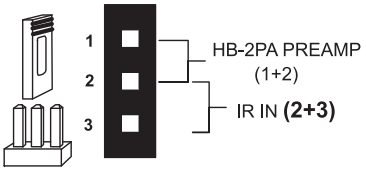


HNB-A Chassis
(inside front view)



(2+3)

JP1 + JP2



3-POSITION HEADER

IMPORTANT NOTES:

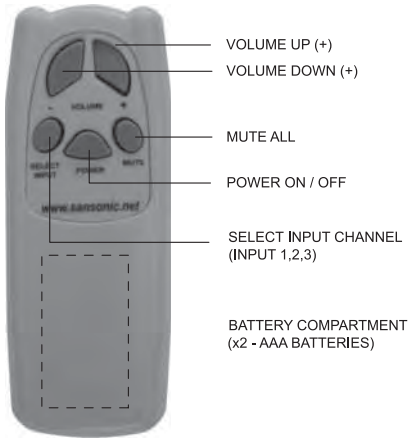
The jumper **MUST be in the 2+3 position of JP1 and JP2** when the **HB-IR** 'IR' card and REMOTE CONTROL are used with HNB-B, HNB-B1 or HNB-B2 models.

When IR remote control is used with an HNB system, the **HB-IR card MUST** be installed in the **HNB-A** unit in the J1 slot (**LEFT** slot).

When the HB-IR card is used the **HB-2PA moves** to the **LEFT** slot of **HNB-B**

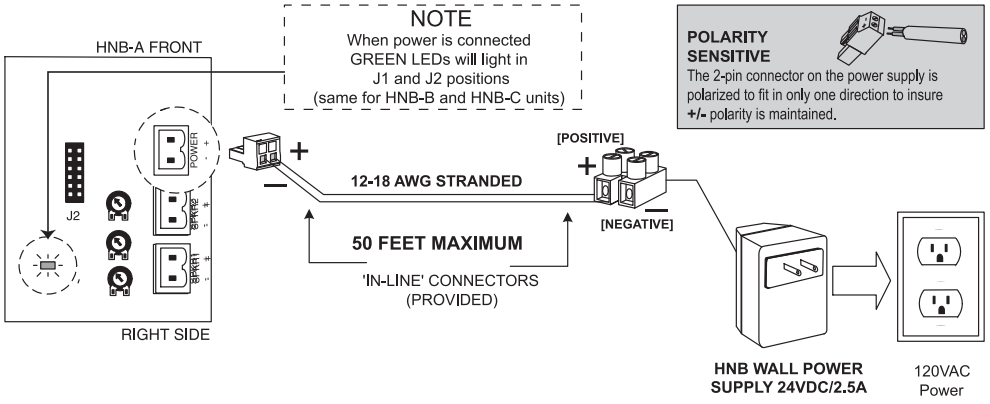
6.8 Hand-held Remote Control (Model HB-IRRC)

HB-IRRC hand-held remote control requires an HNB system equipped with an HB-IR 'IR' remote module. See section 6.7



HB-IRRC
REMOTE CONTROL

6.9 Power Supply - Cord Extension



Some applications may require that the power supply be located up to 50 feet from the HNB-A. This will require the power supply cord to be extended.

1. To extend the distance of the HNB™ power supply, use the 2-position in-line connectors (provided) to terminate additional 12-18 AWG stranded conductors. DO NOT EXCEED 50 feet.
2. IMPORTANT: Insure the correct orientation of positive (+) and negative (-) conductors prior to connection to HNB-A power input. NOTE: To help identify (+ / -) conductors, the power supply cord has Ribs, Stripe or Red marker on the (+) side; see 'TIP'.

TIP
Power supply cord jacket has RIBS, STRIPE or RED marker on the positive (+) side.

SECTION 7.0 - HNB-A + HNB-B TROUBLESHOOTING GUIDE

Please follow these tips before calling the Sansonic hotline for assistance:

1) Read and review all sections and follow all instructions in this manual.

2) Before terminating speakers to SPKR1 (J3-Right) + SPKR2 (J4-Left), verify that all wiring is free from shorts, opens, crosses or ground problems. Please verify polarity of speaker wiring (+/-).

3) After connecting power supply (J5); verify that LED's have lit on the front HB card panels and backplane in J1 and J2 positions for both HNB-A and HNB-B (Green LED). If there is no power LED light on HNB-B; verify wiring in the RJ45 to meet EIA-568B per section 4.7 and 4.8 (power on pins 3+6). If there is no light and AC power source is confirmed; verify that polarity (+/-) wiring is correct with Red or Ribbed wire as (+) positive. Use front panel soft button and IR remote control to cycle power On/Off.

4) If no Override page is heard and input audio sources are not muted during "master-override" page; verify wiring termination polarity (+/-) to the MO connector and insure 'Volt Sens' POT on rear is adjusted correctly and front MO-IN 'orange' LED lights.

5) If after power and system terminations have been made and no audio is detected, insure volume gains are adjusted properly and that all speakers are of the proper impedance and/or have correct impedance-matching transformers (25V or 70V / see HNB-70V2X section 5.2) installed.

6) If video signal / picture does not appear at AV projector, please verify LED's are "on" (Green) at the HB-V front panel and HB-VR receiver which includes power and signal (see section 6.3 to 6.6). Insure all CAT5e/RJ454 terminations meet EIA-568B (section 4.7 and 4.8) and terminations of VGA, S-video and Composite video are made properly at the AV projector. Finally, insure the AV Projector and source are transmitting and set to compatible source and resolution (see section 6.6). NOTE: Image quality such as; Color, Brightness, Focus, Blurring are most likely adjustments in the projector, computer and or video source.

7) It the HB-IRRC remote control does not function please check the AAA batteries (x2) to insure a full charge. Also check to insure direct sunlight or strong florescent lights are not interfering. Reminder: The IR remote control will not operate beyond (50) feet.

8) If you continue to experience difficulty, please call Sansonic at 626-454-8203 or email tim@sansonic.net

SECTION 8.0 - HNB-A + HNB-B WARRANTY

Please read the following terms and conditions, as they are affected by the installation conditions as well as Sansonic Electronics USA LLC obligations and conditions which must be met to activate them. Sansonic Electronics USA LLC does not assume nor does it authorize any person to assume or extend on its behalf any other warranty obligation or liability.

Sansonic Electronics USA *Digital Audio Mixer Amplifier Model HNB-A and HNB-B, HNB-B1, HNB-B2 and all related accessories are* warranted for a period of three (3) years from the date of shipment to the customer. During such warranty period the electronic unit shall be free from defects in materials or factory workmanship so that the electronic unit shall substantially conform to the Sansonic Electronics USA LLC published specifications. The warranty applies to all first quality products. This limited warranty is subject to further conditions as outlined below.

All electronic units shall be installed and used in accordance with Sansonic Electronics USA LLC specifications in effect at the time of installation.

Sansonic Electronics USA LLC will not be responsible for defects caused by improper or unreasonable use, water intrusions, lightning, or malfunctions when electronic units have been modified or operated in excess of their rated capacities, altered, serviced, or installed in an other than workman-like manner or industry accepted practices.

This limited warranty is void if the label bearing the electronic units date of manufacture and serial number is removed or otherwise defaced to the point of not being legible.

You must notify Sansonic Electronics USA LLC of any electronic unit failure covered by this warranty within (30) days of first observation of failure by writing (electronic or paper) to the Customer Service department at: Sansonic Electronics USA LLC, 9950 E. Baldwin Place, El Monte, CA 91731 (T) 626-454-8203, (F) 626-466-1338 www.sansonic.net.

After an inspection has been conducted by Sansonic Electronics USA LLC or its authorized Representatives, and the validity of the return has been verified, a written Return Authorization (RA) to return must be issued by Sansonic Electronics USA LLC prior to any return. Electronic devices returned and found to be defective, in Sansonic Electronics USA LLC sole judgment, will either be replaced (replacement products may be remanufactured or reconditioned devices) or repaired without charge. The replaced or repaired electronic unit is warranted for the remainder of the original warranty period.

The foregoing constitutes the entire obligation of Sansonic Electronics USA LLC, and there are not other warranties expressed or implied, including any warranty or merchantability or fitness for any purpose whatsoever. Liability is limited to the above, and Sansonic Electronics USA LLC, shall in no event be liable for any incidental or consequential damages other than to replace or repair the electronic device(s) itself.

Please note: Some jurisdictions do not allow exclusion or limitation of incidental or consequential damages or limitations on how long an implied warranty lasts, so the above limitation or exclusion may not apply to you.

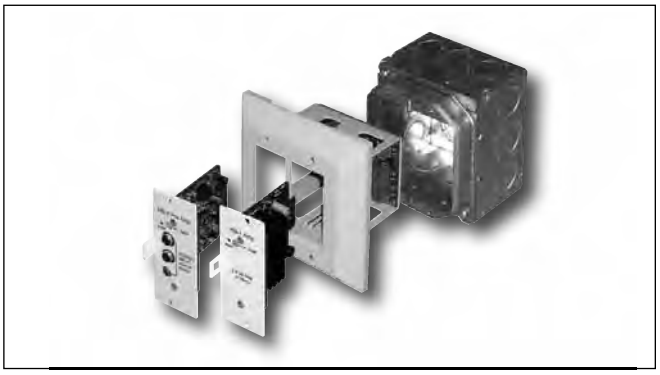
Reference to Sansonic Electronics USA LLC in this section shall mean, for the United States: Sansonic Electronics USA LLC, 9950 E. Baldwin Place, El Monte, CA 91731.

Ask about Sansonic's other HNB™ Series Digital Amplifiers

HNB-C components
(requires HNB-A system)

HNB™ Modular Digital Wireless Mixer Amplifier
HNB-C System may be added to HNB-A or HNB-A + HNB-B

HNB™ Digital Audio Mixer Amplifier
Model HNB-PA225



HNB™ Modular
Digital Audio Power Amplifiers

SANSONIC

9950 E. Baldwin Place, El Monte CA 91731
(T) 626-454-8203, (F) 626-433-1079, www.sansonic.net